

**Report from James T. Hoffman on the:  
2<sup>nd</sup> International Conference on Rusts of Forest Trees  
IUFRO Working Party 7.02.05  
China and Tibet, August 15-31, 2002**

Since 1995 I have coordinated white pine blister rust disease surveys of five-needled pines in the Intermountain Region with my counterparts in Regions 1, 2, and 3. My studies have extended the current knowledge of the range of this introduced fungal pathogen as it slowly extended south from an accidental infection location in British Columbia, Canada in 1909. The disease now occurs on numerous white pine species throughout the Western United States, and has the potential to infect commercial white pine stands in Mexico in the near future.

Based upon my knowledge and experiences of surveying widely dispersed white pine stands I submitted proposals in December 2001 to the organizing committee of the **2<sup>nd</sup> International Conference on Rusts of Forest Trees (IUFRO)**, and to the USDA Forest Service, for permission to participate in the conference and field trips to be held in China and Tibet in August 2002. I received both professional and agency approvals for meeting participation and presentation of a paper and a poster at the work conference. I also co-chaired one of the panel discussions at the request of the conference organizing committee.

Following is a report on my impressions on the International Rust Conference, and on the sciences of forestry and forest pathology in China and Tibet. First, however, are my general observations of China.

China, the country and people

It's a fact that one-fifth of the human population (1.2 billion) lives in China, in an area that comprises only 7.5% of the earth's land surface, but you don't appreciate the density of people to land until you see situation personally. My portal to and from China was Beijing, home to 15-18 million people. Shanghai, Hong Kong, Nanking, and Canton all have over 10-million people, yet there are over a dozen more cities as large as New York or Los Angeles that most foreigners have never heard of let alone visited. Despite the size of these large cities, greater than 80% of the Chinese population still live in rural areas, mostly tied to agricultural production.

While the rest of the world is languishing in an extended recession, the economy in China is booming. Beijing is host to the 2008 Summer Olympics, which has created a huge boom in transportation and building construction projects. We saw similar construction activity (we heard 8,000 construction cranes were operating in Beijing alone!) occurring in other cities as foreign investors are building foundries and factories throughout China to take advantage of the abundant and inexpensive labor force. This growth comes with a heavy price tag—there is constant traffic congestion, which along with fuels expended for cooking and heating, has resulted in the worst air pollution on the planet. Meanwhile overtaxed water/sewage/electrical utility systems struggle to maintain services.

For our health we were fortunate that our conference was held about 650-miles southwest of Beijing at the newly built Yangling International Agricultural Convention Center, near the ancient city of Xi'an, which is almost in the center of China. This vast agricultural area is comparable to the central part of the United States that we called the “great bread basket,” when I was in grade school. It was interesting to learn that the rich loess soil that has been farmed there for almost 5,000 years was formed by the same processes of eons of wind deposition that we see in the Palouse region of Washington and Idaho, and in the central plains States in the US.

Traveling by train to Xi'an from the east and later from the city to the south, we traversed almost a thousand miles of almost continuous corn fields. Interspersed in the corn were small villages surrounded by gardens growing various cabbages, legumes, onions, squashes, potatoes, sweet potatoes, and fruit trees. Chickens, pigs, oxen, and a few cattle were observed, along with stacks of corn stalks that are burned as fuel. Someone in our party had been to the area four years previous and reported that wheat was the featured crop in the rotation the year he had been there.

In some areas, where climate and topography are favorable to minimize frost damage, apple, peach, and pear orchards are being planted at a rate of almost 4,000 acres/year. Most of these products are for export purposes. The increase in new fruit varieties and at a cheaper cost of production has had a big negative effect on fruit production in the United States.

I thought rice would be a big part of our diet but it is raised mainly in southeastern China, and we were only served it once in about every three meals.

## Forestry in China

With such a large population to feed and long history of civilization it wasn't surprising to find out that China is a country short on forest reserves. Only 16.5% of the total land area in China is forested, most of which is in inaccessible mountainous areas, or in Tibet. Nevertheless, China is committed to forest conservation for multiple uses, including wood and fuel production, watershed stability, and animal/plant protection. For instance, much ado is made of the forested areas set up for protection of the giant pandas. The Chinese foresters were also proud to point out that ten years ago only 13.9% of their land area was forested. Theoretically all the land and forests in China belong to the State. Obviously provisions have been made to provide for agricultural production and other natural resource extraction. About 40% of the forested areas are managed exclusively for national goals and objectives with the remaining forested areas being relegated to management by localized "collectives."

China is large enough to be subdivided into four time zones, but only one time zone is recognized--Beijing time. The country can be generally broken down into three topographic zones: the eastern plains; highlands; and mountainous areas. The Himalayas in the southwest part of China (known as the Tibetan Autonomous Region) are the largest and most famous mountain range in the world, however, many other ranges occur in central China, and all affect weather, and the composition and distribution of vegetation.

The Forestry Ministry reports 190 tree species, a large percentage of which are in tropical forests that we did not visit in the southeastern part of China. We did observe genera of *Pinus*, *Abies*, *Picea*, *Larix*, *Juniperus*, *Populus*, and *Salix*, *Quercus* in the same physiognomic location that we see them in this country. For instance, as we drove out of the agricultural areas we entered juniper/cedar stands that merged in with oak forests that gave way to dry pine forests. As the elevation rose we entered white pine and other pine forests, and then saw larch and fir, with spruce stands in the highest elevations just below tundra or high plains. Riparian areas, and the few logged areas we observed, had aspen, birch, beech, and many species of *Acer*, *Populus*, and *Prunus*.

Outside of the tropical forests, much of the commercial forest area in China is in lower elevation (less than 11,000 feet) stands in Tibet. About half the

conference attendees (16 of us and four Chinese hosts) went on post-conference forestry and forest pathology field trip to Tibet. We found very few roads in any forested areas in China, however, evidence of past logging is found just about everywhere. The two times we inspected mosaics of even-aged stands we found stumps, presumably from previous clear-cut harvest logging accomplished via horse or oxen. We don't know if this or any logging was in response to insect or fire loss. Summer thunderstorms are common in the mountains, so we speculated that fire was a normal part of their forest ecosystems. Our hosts informed us, however, that insects and diseases in China kill more trees annually than does fire.

Most of the timber harvest looked to be localized "pick and pluck" actions that we were led to believe was administered by the collective-forestry system. We tried to inspect a small band-saw mill during a gas stop in a small town but were denied access by the mill operators. They may have thought we were environmentalist's intent on closing their facility. We saw more foreigners in Tibet than in any part of China. Lots of people go there on a quasi-religious pilgrimage. The widespread presence of religious statues and symbols, along with exotic monks, monasteries, and prayer wheel twirlers, can give you strange and radical thoughts, especially when you're exposed to incense, barley beer, and the thin air. I took altitude sickness medicines and avoided illusions and confusion.

Some members of our group felt questions concerning forestry practices were not always being adequately answered. Some of this was due to miscommunication because of translation problems, but I think it was due to the drastically different social, economic, and cultural mores associated with forestry practices in China than anywhere else in the world.

The biggest forestry program in China today is afforestation. Five years ago the Chinese government recognized they had severe problems with soil, water, and air pollution, and escalating desertification of rangeland, all due to an increasing human population and increased demand for wood products. They resolved to create animal and plant reserves; recover former forested areas from marginal farmland; plant urban areas and highways with trees; and plant the eroded range and plains with windbreaks and shelterbelts. They set an ambitious goal in 2000 of trying to afforest 150-million acres by the date of 2010!

We saw trees planted with military precision, every 6.5 feet along both sides of every roadside we traveled, sometimes two or three rows deep. Poplar species constitute almost 20% of the artificially regenerated forests because they grow fast and can be started with scions. In Tibet where cattle, sheep, goats, and yaks roam freely on the range and roads in many areas, poplars are established in raised 3.25-foot diameter by 4-foot tall rock enclosures on 13-foot centers to provide animal protection. This modern planting effort almost looks like the new Great Wall of China!

### Aspects of Forest Pathology in China

The main feature of the conference was the opportunity to see, meet, and visit with many of the current experts on rusts of forest trees. From a personal development standpoint the experience was both humbling and exhilarating because my work was presented, reviewed, and accepted as good science.

The history of forest pathology in China is relatively short, starting in the 1940's. The forest entomology and pathology programs in China were really given validation and life during the late 1970's and early 1980's, when the Forestry Ministry organized a nation-wide general survey of forest pests. Over 13,500 people worked for five-years to identify 1,263 insect pests, and 2,924 forest diseases on the 190 tree species throughout China.

On our field trips we were surprised to find we knew many of the pathogens we saw even though the hosts were not familiar to most of us. There are several rust diseases of pines that looked familiar, like gall rust and dwarf mistletoe on *Pinus densata*, which resembles ponderosa pine. We were looking for white pine blister rust on *Pinus armandii* but didn't find any.

The majority of disease problems we observed were on the *Populus* and *Salix* species planted for afforestation purposes. It appeared about 30% of all roadway plantings die, likely from drought stress or animal damage. Leaf rusts caused by *Melampsora* sp. were commonly observed. In the conference we learned that this rust genus is causing problems for poplar breeders and growers in Finland, Sweden, Brazil, Chile, Canada, and in the United States.

I have observed *Melampsora* rust in the hybrid poplar plantations that are ever-increasing on former agricultural land in southern Idaho. I recommend

a cooperative work agreement between the Boise Field Office and George Newcomb, professor of forest pathology at the University of Idaho to study the distribution and impact of leaf rusts on both native and planted poplars in Idaho. Dr. Newcomb has studied this group of fungi during previous work with the poplar growers in western Washington State.

I had no previous experience with IUFRO meetings, but I honestly benefited from the rust conference and field trip experiences. The meetings provide opportunities to meet and discuss forestry and forest pathology issues in a structured and stimulating environment. As many of our problems are now global in nature, I think it ultimately pays the Forest Service to have personnel with numerous professional contacts and experiences.